

REMARKS

Claims 2-4, 7, 10-12, 15, 20, and 22-30 have been cancelled. New claim 37 has been added. Thus, claims 1, 5-6, 8-9, 13-14, 16-19, 21, and 31-37 are currently pending in the subject application and are presently under consideration. Claims 1, 5-6, 8-9, 13-14, 16-17, 19, 21, 31-35, and 37 have been amended as shown on pp. 2-5 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Rejection of Claims 1-21, 24-28 and 31-36 Under 35 U.S.C. § 101

Claims 1-21, 24-28 and 24-28 stand rejected under 35 U.S.C. § 101. Claims 2-4, 7, 10-12, 15, 20, and 24-28 have been cancelled. Claims 1, 13, and 31 are the pending independent claims. Reconsideration and withdrawal of the rejection of claims 1, 5-6, 8-9, 13-14, 16-19, 21, and 31-36 under 35 U.S.C. § 101 is respectfully requested in view of the comments below.

Regarding rejection of independent claim 1, Examiner contends that the claimed subject matter is non-statutory, because it is contended that the disclosure covers signals and carrier waves. It is contended that because the disclosure states that “the present invention has been described with reference to acts and symbolic representations of operations that are performed by a computer,” the invention can be described as manipulation by a processing unit of electrical signals representing data bits which causes a resulting transformation or reduction of the electrical signal representation. Applicants’ representative respectfully submits that this point, even if valid, does not bear on the patentability of claimed subject matter of claim 1 under 35 U.S.C. § 101.

Moreover, from this proposition, it is concluded without treatment of the elements of claim 1, that the claimed invention is directed to signal processing. Applicants’ representative respectfully disagrees. The disclosed subject matter relates to employing a page aggregator and a heap manager to facilitate operations of concurrent transactions at a subpage level (*e.g.*, a row level), during modifications of a data base by multiple users. *See, e.g.*, Summary. Accordingly, the conclusion that the disclosure is non-statutory does not follow from the false premise that the disclosure (and thus the claim at issue) covers signals and carrier waves, regardless of whether they are or are not a manufacture within the meaning of under 35 U.S.C. § 101.

Furthermore, applicants' representative respectfully notes that this ground for rejection of independent claim 1 is an improper new ground for rejection under MPEP § 706.07[R-5] (a) not necessitated by applicants' amendment. For example, the prior action contended that the previously presented claim was directed to a computer program per se. Notably, this ground for rejection has not been maintained in the present action, which instead contends that the claim refers to signals or carrier waves. Thus, applicants' representative respectfully requests withdrawal of the finality of the instant action according to MPEP § 706.07[R-5] (a).

Claim 1, as previously presented and as currently amended for further clarity, recites a computer-implemented database engine in a computer-implemented database system. The Federal Circuit has clearly established in *Eolas Techs., Inc. v. Microsoft Corp.*, 399 F.3d 1325, 1338 (Fed. Cir. 2005) and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358. (Fed. Cir. 1999) that inventions such as that claimed by applicants are statutory.

This court must also decide whether software code made in the United States and exported abroad is a "component of a patented invention" under 271(f)... § 271(f) refers to "components of a patented invention."... Title 35, § 101, explains that an invention includes "any new and useful process, machine, manufacture or composition of matter."... Without question, ***software code alone qualifies as an invention eligible for patenting under these categories***, at least as processes. *Eolas Techs., Inc. v. Microsoft Corp.*, 399 F.3d 1325, 1338 (Fed. Cir. 2005). (emphasis added).

Applicants' representative respectfully disagrees with the Examiner's contentions and submits that the requirements necessary to fulfill the conditions for patentability under 35 U.S.C. § 101 are satisfied. The Federal Circuit in *Eolas Techs., Inc. v. Microsoft Corp.* clearly established that software code alone is statutory subject matter, ***at least*** as processes. However, the allowance for software code alone as processes in *Eolas* does not limit the otherwise patentable subject matter categories.

For example, amended independent claim 1 and recites a computer implemented system. Systems, processes, and manufactures are by themselves statutory subject matter. In addition, it should be reasonably understood by one skilled in the art that a system referring to components that perform actions (*e.g.*, components that operate across concurrent database transactions, and component that tracks a space availability) cannot be implemented by software code alone. Thus

previously presented independent claim 1 was inherently directed to computer-related entities capable of performing the recited actions. *See, e.g.*, [0025]. For the avoidance of doubt, claim 1 has been twice amended to indicate that the computer-implemented database system comprises the computer-implemented database engine as further limited by the remaining claim elements. By the standards set forth in the above decision, a computer-implemented system, in the form of software, hardware, or the combination of both clearly falls within the categories of statutory subject matter.

Regarding dependent claims 5-6, and 8-9, these claims are contended to recite computing steps which are merely descriptive and lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 U.S.C. § 101. Applicants' representative respectfully disagrees and submits that the subject claims as previously presented and as currently amended modify and further limit the elements of claim 1. For example, dependent claim 5 recites that the "computer-implemented page aggregator [of claim 1] enables a determination of space consumptions across a respective copy of database data page employed by each database transaction." Dependent claims 6 and 8-9 similarly modify the elements of independent claim 1. Thus the subject claims clearly recite the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 U.S.C. § 101.

Furthermore, the subject claims produce a useful, concrete, and tangible result as described below with regard to independent claims 13 and 31.

Because the claimed process applies the Boolean principle [abstract idea] **to produce a useful, concrete, tangible result** ... on its face the claimed process comfortably falls within the scope of §101. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358. (Fed. Cir. 1999) (Emphasis added); *See State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1601 (Fed.Cir.1998). The inquiry into patentability requires an examination of the contested claims to see if the claimed subject matter, **as a whole**, is a disembodied mathematical concept representing nothing more than a "law of nature" or an "abstract idea," or if the mathematical concept has been **reduced to some practical application rendering it "useful."** *AT&T* at 1357 citing *In re Alappat*, 33 F.3d 1526, 31 USPQ2d (BNA) 1545, 1557 (Fed. Cir. 1994) (emphasis added).

According to *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), the standard set forth by the Federal Circuit for determining whether claims are directed towards statutory subject matter is whether the claims **as a whole** can be applied in a practical application to **produce a useful, concrete and tangible result**. It is the result of the claims as applied in a practical application that is germane to the determination of whether the claims are directed towards statutory subject matter. The subject claims clearly satisfy this legal standard.

Regarding independent claims 13 and 31 as well as dependent claims 21 and 36, examiner contends the claimed subject matter is non-statutory, because it fails to produce a physical transformation. At the outset, applicants' representative respectfully notes that this ground for rejection of independent claims 13 and 31 is an improper new ground for rejection under MPEP § 706.07[R-5] (a) not necessitated by applicants' amendment. For example, the prior action contended that the previously presented claims failed to produce a useful result. Notably, this ground for rejection has not been maintained in the present action regarding claims 13 and 21. Thus, applicants' representative respectfully requests withdrawal of the finality of the instant action according to MPEP § 706.07[R-5] (a).

In addition, regarding claims 31 and 36, examiner contends that the subject claims do not produce a useful result. Applicants' representative disagrees that a physical transformation is necessary and submits that the necessary requirements to fulfill the conditions for patentability under 35 U.S.C. § 101 are satisfied. According to *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), the standard set forth by the Federal Circuit for determining whether claims are directed towards statutory subject matter is whether the claims **as a whole** can be applied in a practical application to **produce a useful, concrete and tangible result**. It is the result of the claims as applied in a practical application that is germane to the determination of whether the claims are directed towards statutory subject matter, not whether the underlying claims (or excerpted portions) recite why the applicant believes the claimed subject matter to be useful.

In other words, "a claimed invention is directed to a practical application of a 35 U.S.C. § 101 judicial exception when it: (A) "transforms" an article or physical object to a different state or thing; **or** (B) otherwise produces a useful, concrete and tangible result, . . ." *See, e.g.*, MPEP 2106 [R-5] IV.C.2(1-2) (emphasis added). Furthermore, a rejection should not be imposed based on lack of utility, if after review of the claims **and** the supporting written description, a person of

ordinary skill in the art would immediately appreciate why the invention is useful based on the characteristics of the invention and the utility is specific, substantial, and credible. MPEP § 2107 [R-5] II.(A). Alternatively, a rejection should not be imposed based on lack of utility, if after review of the claims *and* the supporting written description, applicant has credibly asserted for the claimed invention any specific and substantial utility (*i.e.*, useful for any particular practical purpose). *Id.* The subject claims additionally satisfy this examination guideline.

In particular, independent claims 1, 13, and 31 (as well as the dependent claims) recite computer-implemented database systems, computer-implemented engines or computer-implemented methods that operate across concurrent transactions to obtain information on an aggregate size change that occurs on a data page and/or tracking a space availability for the data page over all the concurrent transactions. As a result of the claimed invention, concurrent transactions can operate on various copies of a data page, with each transaction modifying its respective copy of the data page. *See e.g.*, paragraphs [0008] – [0010]. Thus, the claimed invention facilitates active transactions to efficiently keep their respective copies up to date with committed version of that page. In this regard, the framework enables a commit operation to occur with efficiency and simplicity, thus improving multi-user operation and conserving system resources. *Id.* These claims clearly recite an invention that produces a useful, concrete, and tangible result. In addition, applicants’ representative respectfully submits that one skilled in the art would readily appreciate that, based on the aforementioned characteristics, the described utility is specific, substantial, and credible. Alternatively, the indicated paragraphs credibly assert specific and substantial utility of the invention. The rejection of subject claims based on lack of utility should be withdrawn.

Regarding the rejection of claim 24, it is noted that the claim has been cancelled. However, because the rejection is directed to a computer readable medium claim and dependent claims 21 and 36 recite computer readable media, it remains necessary to address this rejection. Examiner notes that “[b]ased on the intrinsic evidence, the specification does not appear to define ‘medium’.” Accordingly, it is concluded, that such a medium can include, *inter alia*, electromagnetic or infrared propagation media, and are therefore non-statutory. Applicants’ representative respectfully disagrees with this conclusion as relying on a false premise. For example, applicants’ representative respectfully notes that a medium is modified by “computer readable” which applicants treat in the specification. *See, e.g.*, [0025], [0048], [0085], *etc.* As a

further example, computer “components can execute from various computer readable media having various data structures stored thereon”, [0025], and computer drives (*e.g.*, hard drives, CD ROMs, *etc.*) “and their associated computer-readable media provide nonvolatile storage of data, data structures, computer-executable instructions, *etc.* for the computer . . .”, [0048]. “Although the description of computer-readable media above refers to a hard disk, a removable magnetic disk and a CD, it should be appreciated by those skilled in the art that other types of media which are readable by a computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, and the like, can also be used in the exemplary operating environment, and further that any such media may contain computer-executable instructions for performing the methods of the present invention.” *Id.* Thus, the term computer readable media is clearly defined.

Regarding dependent claims 14, 16-19, and 32 -35, these claims are contended to recite computing steps which are merely descriptive and lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 U.S.C. § 101. Applicants’ representative respectfully disagrees and submits that the subject claims as previously presented and as currently amended modify and further limit the elements of the respective independent claims as described above regarding claims 5-6 and 8-9. Moreover, dependent claims 14 and 16-19 further limit a computer-implemented method of claim 13, thus constituting statutory subject matter under *Eolas Techs., Inc. v. Microsoft Corp.* Thus the subject claims clearly recite the necessary physical articles or objects to constitute a machine or a manufacture or modify a statutory process within the meaning of 35 U.S.C. § 101.

Reconsideration and withdrawal of the rejection of amended independent claims 1, 13, and 31 (and associated dependent claims 5 – 6, 8 – 9, 14, 16 – 19, 21, and 32 – 36) under 35 U.S.C. § 101 is respectfully requested in view of the foregoing comments.

II. Rejection of Claims 1, 24, 31, 33, 34 and 36 Under 35 U.S.C. § 102(b)

Claims 1, 24, 31, 33, 34 and 36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by US Pub. No. 2002/0129011 issued to Benoit Julien (hereinafter “Julien”). Claim 24 has been cancelled. Thus, claims 1 and 31 are the pending independent claims. Applicants’ representative respectfully requests withdrawal of this rejection, because Julien does not expressly or inherently describe each and every limitation of applicants’ claimed invention.

For a prior art reference to anticipate, 35 U.S.C. § 102 requires that “*each and every element* as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999) (quoting *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)) (emphasis added).

The present invention relates to systems and methods in support of database page synchronization. With the invention, modifications of a database may be made by multiple users by facilitating operations of concurrent database transactions at a subpage level. For instance, such concurrent database transactions can operate on various copies of a database data page, with each database transaction modifying its respective copy of the database data page. Accordingly, the claimed invention facilitates active database transactions to efficiently keep their respective copy or copies up to date with the committed version of that database data page. By assuring space availability for a particular database data page prior to a commit operation, the framework enables a commit operation to occur with efficiency and simplicity, thus improving multi-user operation and conserving system resources.

In one aspect, the claimed invention teaches a computer-implemented page aggregator operating across a plurality of concurrent database transactions to retrieve information on an aggregate size change that occurs on the various copies of a particular database data page. Such aggregate size change information can facilitate determination of space available for various operations to be performed on that database data page. In a client/server request/response model, this aspect operates on the transactions from the client/request side during modifications of a database by multiple users by facilitating operations of concurrent database transactions at a subpage level.

In addition, as discussed in Reply to Office Action dated January 18, 2007, applicants’ representative respectfully submitted that the term “data page” clearly has meaning to one having ordinary skill in the art. That meaning is referred to in the specification, among other places, at Paragraphs [0005] and [0008]. Accordingly, applicants’ representative respectfully submits that one having ordinary skill in the art would appreciate that databases typically organize active records in physical memory pages, organize pages into “heap files,” and keep track of which

pages are in memory at any point in time. Applicants' representative submitted therein that use of the term "data page" in the claims or in such a specification passage as "concurrent transactions can operate on various copies of a data page, with each transaction modifying its respective copy of the data page" would lead one having ordinary skill in the art to appreciate that, in this context, "data page" refers to a specific structure that is based, at least in part, on a subset of database data as it is copied into physical memory. *See* paragraph [0008]. For additional clarity, the subject claims have been extensively amended to recite database data page, database transactions, concurrent database transactions.

In contrast, Julien merely discloses collecting information from several sources of "unstructured" digitized data such as for extracting business-related information from multiple web pages. Notably, Julien contrasts "unstructured" data such as web pages with "structured" data such as databases and targets for collection and aggregation this "unstructured data". *See e.g.*, paragraphs [0005] and [0006]. In particular, Julien defines the term "unstructured" with respect to the information being searched from the point of view of the searcher, wherein the searcher is unaware of any particular layout or structure organizing the information contained in the data. Paragraph [0011]. Sources of unstructured data are considered to be "unstructured" in that they share no common structure or layout for the information contained therein. *Id.* In addition, Julien describes an aggregator unit that combines information extracted from the web pages for output to the requesting user. *See e.g.*, paragraph [0042]. The aggregator unit is described as using rules to correlate and establish relationships between the information elements identified by tags in web pages. *See e.g.*, paragraphs [0043] – [0046].

Regarding amended independent claim 1, the claim recites: ***aggregator component that operates across concurrent database transactions to obtain information on an aggregate size change that occurs on a database data page***. Regarding amended independent claim 31, the claim recites: ***determining an aggregate size change for the database data page***. Page 5, paragraph [0046] is cited for support that Julien discloses these limitations of applicants' claimed invention. At the indicated paragraph, Julien merely describes what is in essence a search distance from a web page tag (*e.g.*, html tag) of interest. For instance, the example aggregation process of Julien implements a metric distance of 50 words before and 100 words after a seed tag, within which other relevant tags can be gathered in relation to the seed tag. In contrast, as described above, the claimed aggregate size change of a database data page refers to the

aggregation of respective size changes occurring for concurrent database transactions modifying respective copies of a particular database data page. Thus, specifying a particular search distance from an html tag to search in the unstructured data of a webpage cannot be said to expressly or inherently describe these aspects of applicants' claimed invention.

In addition, page 7, paragraph [0076] is cited for support that Julien discloses the recited limitation of amended claim 1: ***the database data page is copied and modified by database transaction(s) that requires modification thereof***. This portion is also cited for support that Julien discloses the recited limitation of claim 31: ***copying a database data page to a reserved space for the database transaction***. At the indicated paragraph, Julien merely describes extracting web page information as described above, for the purpose of updating a database containing the type of information sought from the web page. In that respect, that Julien extraction and aggregation refers to collecting the information from the unstructured web pages and depositing it in a database. In contrast, applicants' claimed database data page is being copied by an active database transaction that refers to copies of the database data page (structured data) made when one of a plurality of concurrent database transaction requires modification to the database data page. As a result, Julien's extracting unstructured web page information cannot be said to expressly or inherently describe these aspects of applicants' claimed invention.

Examiner explicitly disagrees with this contention while reiterating this citation and referring to page 7, paragraph [0078] for further support. However, the indicated portions reinforces the conclusion that a system according to Julien (presumably a database system) merely retrieves updated information such as contact information, retrieved directly from the Web page(s) connected to the URL address(es), rather than a ***database data page . . . [being] copied and modified by database transaction(s) that requires modification thereof***. Thus, applicants' representative respectfully submits that Julien's copying webpage data to a database does not expressly or inherently describe a database transaction copying a database data page that the database transaction requires modification of.

Moreover, regarding claim 1, page 3, paragraph [0021] is cited for support that Julien discloses the limitation: ***a computer-implemented page aggregator component that operates across concurrent database transactions***. However, this excerpted clause refers to operating across concurrent database transactions to obtain information on an aggregate size change that

occurs on a database data page as described above. At the indicated paragraph, Julien describes the aggregator unit processing the information extracted from the unstructured data (e.g., web page elements) for generating an output containing extracted and aggregated information. Thus, the Julien aggregating web page data process cannot be said to explicitly or implicitly describe *a computer-implemented page aggregator component that operates across concurrent database transactions* to obtain information on an aggregate size change that occurs on a database data page.

Reconsideration and withdrawal of the rejections of independent claims 1 and 31 (and associated dependent claims 33, 34, and 36) under 35 U.S.C. § 102(b) is respectfully requested in view of the comments above.

III. Rejection of Claims 2, 8, 9, 10, 13-16, 21-23, 25, 29, 30, 32 and 35 Under 35 U.S.C. §103(a)

Claims 2, 8, 9, 10, 13-16, 21-23, 25, 29, 30, 32 and 35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Julien in view of US Patent No. 6,643,753 issued to Avner *et al.*, (hereinafter “Avner”). Claims 2, 10, 15, and 22-23, 25, and 29-30 have been cancelled. Claim 13 is an independent claim. Reconsideration and withdrawal of the rejection of claims 8-9, 13-14, 16, 21, 32, and 35 is respectfully requested, at least because Julien alone, or in combination with Avner, does not teach or suggest each and every limitation of applicants’ claimed invention, nor does the combination render applicants’ claimed invention obvious.

To reject claims in an application under § 103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some apparent reason to combine the known elements in the fashion claimed by the patent at issue (e.g., in the references themselves, interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace, or in the knowledge generally available to one of ordinary skill in the art. To facilitate review, this analysis should be made explicit. Second, there must be a reasonable expectation of success. *Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.* See MPEP § 706.02(j). See also *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.

S. ____, 04-1350, slip op. at 14 (2007). The reasonable expectation of success must be found in the prior art and not based on applicant's disclosure. *See In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

Regarding independent claim 13, applicants' representative respectfully submits that the virtual memory management of Avner does not cure the above-identified deficiencies of the root reference, Julien. Specifically, Page 5, paragraph [0046] is cited for support that Julien discloses ***obtaining information on an aggregate size change that occur on a database data page as a result of concurrent database transactions operating on respective copies of the database data page***. At the indicated paragraph, Julien merely describes what is in essence a search distance from a web page tag (e.g., html tag) of interest. For instance, the example aggregation process of Julien implements a metric distance of 50 words before and 100 words after a seed tag, within which other relevant tags can be gathered in relation to the seed tag. In contrast, as described above, the claimed aggregate size change of a database data page refers to the aggregation of respective size changes occurring for concurrent database transactions modifying copies of a particular database data page. Thus, specifying a particular search distance from an html tag in the unstructured data of a webpage cannot be said to expressly or inherently describe these aspects of applicants' claimed invention.

Regarding independent claims 13, Examiner concedes that Julien fails to disclose ***tracking a space availability for the database data page over all the concurrent database transactions***. In addition, amended independent claim 1 recites ***a computer-implemented heap allocation component that employs the information on aggregate size change to determine an availability of space for the database data page***. Examiner contends that Avner provides such teaching at column 11, lines 2-8.

Applicants' representative respectfully disagrees with such contention. Referring to FIG. 1 of applicants' specification, the database engine 100 can also incorporate a heap manager 120. Paragraph [0026]. Space consumed on a database data page, as well as the space available on a database data page can be determined and supplied to heap manager 120. *Id.* The heap manager 120 can then track availability of space on the database data page, and determine whether sufficient space is available to perform some part of or all of a transaction. *Id.* Applicants' representative respectfully submits that one having ordinary skill in the art would appreciate that

databases typically organize active records in physical memory pages, organize pages into "heap files," and keep track of which pages are in memory at any point in time. In addition, database memory management is primarily concerned with database data integrity and speed, among other things. Paragraph [0005].

Whereas applicants' "heap manager" is directed to facilitating operations of concurrent transactions in support of database page synchronization, Avner merely discloses a "heap manager" directed to a virtual memory management scheme. Avner col. 9, ll. 6 – 9. Virtual memory is a way of simulating more memory than actually exists in system memory. *See* col. 8, ll. 1 – 8. When physical memory is full, the virtual memory manager transfers or "pages" some of the memory contents to disk. *See* col. 1, ll. 39 – 41. When a virtual memory address that has been paged to disk is accessed, the virtual memory manager loads the corresponding information from the disk back into the physical memory. *Id.* The heap manager allocates large portions or "heaps" of contiguous virtual memory addresses that are to be used by threads during execution. *See* col. 9, ll. 6 – 10.

The virtual memory manager's major design concern aside from running out of address space is fragmentation of the virtual memory space. *See* col. 9, ll. 27 – 30. Thus, as the Avner heap manager operates to manage virtual memory address space, Avner cannot be said to teach or suggest *tracking a space availability for the database data page over all the concurrent database transactions* or *a computer-implemented heap allocation component that employs the information on aggregate size change to determine an availability of space for the database data page*. In addition, the combination of Avner with Julien cannot be said to render applicants' claimed invention obvious.

Regarding dependent claim 16, Julien page 2, paragraph [0014] is cited for support that Julien discloses replacing a row with an inserting pointer. However, at the indicated portions, Julien merely describes following only hyperlinks on a web page that might be associated with contact information such as by examining only web pages linked to the "Contacts" and "Address" hyperlinks for identifying relevant information elements, while ignoring all of the other Web pages. Thus, it cannot be said that following a hyperlink on a web page teaches or suggests the recited limitation of amended dependent claim 16: *replacing a row of the database data page with an inserting pointer*.

Reconsideration and withdrawal of the rejection of claim 13 (and associated dependent

claims 14, 16, and 21) under 35 U.S.C. § 103(a) is respectfully requested in view of the comments above.

Regarding dependent claims 8 and 9, these claims depend directly from independent claim 1 and recite limitations that further modify the heap allocation component of claim 1. Thus, for at least the reasons set forth above regarding claim 1 and 13, Avner cannot be said cure the deficiency of the root reference Julien.

Regarding dependent claims 32 and 35, these claims depend directly from independent claim 31. While Avner cannot be said to cure the deficiencies of the root reference Julien, regarding dependent claim 32, for at least the reasons set forth above regarding claim 1 and 13, Avner cannot be said to teach or suggest *tracking a space availability on the database data page across a plurality of concurrent database transactions working on the database data page*. Regarding dependent claim 35, the claim recites *locking a resource at a row level on the database data page*. Column 2, lines 54 – 55 are cited for support that Avner describes this limitation. However, at the indicated portions, Avner merely describes locking and unlocking one of a plurality of heaps of virtual memory for threads requesting allocation of virtual memory. Thus, Avner cannot be said to teach this aspect of applicants' claimed invention.

Regarding the asserted motivation to combine the references of Julien and Avner, applicants' representative notes that the particular problems to be solved are not the same for the cited references, in addition to differing from that of the applicants' invention. For example, Julien relates to searching, collecting, and aggregating information from unstructured data sources (*e.g.*, web pages) and Avner relates to virtual memory management schemes. In contrast, applicants' invention relates to database page synchronization in the context of concurrent database transactions. As a result, applicants' representative submits that the cited references are not in the same field of endeavor as each other or that of applicants' invention. In addition, Avner and Julien are not even reasonably pertinent to the problems addressed by applicants' invention.

Thus, applicants' representative respectfully submits that such references from disparate fields of endeavor and addressing unrelated problems cannot properly provide a motivation to combine in an obviousness rejection of applicants' claimed invention. While Examiner cites concerns generally facing Avner as motivations to combine with Julien, such concerns as virtual memory fragmentation or efficiency is not pertinent to the database page synchronization

problems of applicants' invention, and may be at best only peripherally related to Julien's searching and collecting information from unstructured sources. Reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) on the basis of Julien in view of Avner is respectfully requested in view of the comments above.

IV. Rejection of Claims 3-7, 11, 12, 17-20 and 26-28 Under 35 U.S.C. §103(a)

Claims 3-7, 11, 12, 17-20 and 26-28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Julien in view of Avner and further in view of U.S. Patent No. 6,889,249 issued to Miloushev *et al.*, (hereinafter "Miloushev"). Claims 3-4, 7, 11-12, 20, and 26-28 have been cancelled. Reconsideration and withdrawal of the rejection of claims 5-6 and 17-19 is respectfully requested, at least because Julien alone, or in combination with Avner, or further in combination with Miloushev does not teach or suggest each and every limitation of applicants' claimed invention. Moreover, the proposed combination does not render applicants' claimed invention obvious.

Regarding the subject claims, these claims depend directly or indirectly from independent claims 1 and 13. Miloushev cannot be said to cure the deficiencies of the root references Julien and/or Avner. Miloushev merely discloses a file server arrangement, similar to a RAID array, where a file switch mediates requests/responses between clients and file servers to allow massive parallel storage to appear transparently as one large storage drive. *See* col. 5, ll. 7-19. In a client/server request/response model, Miloushev operates on the server/response side, taking many parallel sources of file stripes or mirrored file copies and aggregates them into one response stream deliverable in response to a client request. *Id.* In sum, Miloushev relates generally to the field of storage networks, and more specifically to file switching and switched file systems Miloushev *See* col. 1, ll. 28-30.

In this regard, Examiner concedes that Julien or Avner does not explicitly disclose a lock manager as claimed and relies on Miloushev to provide this missing aspect of applicants' claimed invention. Column 37, lines 37 – 42 is cited for support that Miloushev provides this missing aspect. However, at the indicated portions, Miloushev merely describes aggregating a set of file system entities, such as files or directories that reside on different file servers and presenting this set to the clients as a single cohesive entity. Thus Miloushev fails to disclose a lock manager as contended. For example, amended independent claim 1 recites *a computer-*

implemented lock manager that enables sub page level locking across concurrent database transactions. Thus aggregating or splitting a set of file system entities, such as files or directories cannot be said to teach or suggest, among other aspects of the claimed invention, ***a computer-implemented lock manager that enables sub page level locking across concurrent database transactions.***

Column 22, lines 18 – 25 is cited for support that Miloushev discloses each of the concurrent transactions modifies a respective copy of the data page. However, at the indicated portions, Miloushev merely describes a file switch aggregating a client file write transaction by replicating the client data into all of the various files of the file systems synchronously update the file systems with the same data. As amended, independent claim 1 recites ***the concurrent database transactions perform sub-page level operations on a database data page.*** Thus, Miloushev cannot be said to teach or suggest, this aspect of applicants' claimed invention.

Regarding claim 5, column 28, lines 61 – 67 and column 21, lines 59 – 65 are cited for support that Miloushev discloses a page aggregator component that enables a determination of space consumptions across a respective copy of data page employed by each transaction. However, at the indicated portions, Miloushev merely describes a storage array's capacity becoming exhausted (drive full) by using a mechanism termed spillover. "To avoid such failures, file aggregation includes spillover. This . . . allows the aggregator [(file switch)] to use a different storage device (*i.e.*, file server) when one or more of the devices run out of storage space." Applicants' representative respectfully submits that monitoring a file server's storage capacity and providing additional file storage space on a switched file system does not teach or suggest obtaining information on an aggregate size change that occurs on a database data page. For example, amended claim 5 recites ***the computer-implemented page aggregator [of claim 1] enables a determination of space consumptions across a respective copy of database data page employed by each database transaction.*** Moreover, at column 21, lines 59 – 65, Miloushev merely describes a file switch aggregating a various files of the file systems in response to a client file open transaction. Thus, Miloushev cannot be said to teach or suggest, this aspect of applicants' claimed invention.

Regarding claim 6, column 29, lines 5 – 18 is cited for support that Miloushev discloses the page aggregator component determines the space consumption across the respective copy from information available in the lock manager. However, at the indicated portions, Miloushev

merely elaborates on the spillover mechanism and thus fails to disclose this aspect of applicants' claimed invention.

Regarding dependent claim 17, Julien page 2, paragraph [0014] is cited for support that Julien discloses inserting the row on a new page. However, at the indicated portions, Julien merely describes following only hyperlinks on a web page that might be associated with contact information such as by examining only web pages linked to the "Contacts" and "Address" hyperlinks for identifying relevant information elements, while ignoring all of the other Web pages. Thus, it cannot be said that following a hyperlink on a web page teaches or suggests the recited limitation of amended dependent claim 17: ***inserting the row on a new database data page.***

Regarding claims 18-19, column 36, lines 25 – 26, column 38, lines 46 – 58, and column 37, line 65 - column 38, line 2 are cited for support that Miloushev discloses storing the information (on an aggregate size change that occur on a database_data page) in the locks, discarding the locks upon a roll back of a transaction , and discarding the locks upon committing a transaction. However, at the indicated portions Miloushev merely discloses the concurrency problems in the context of distributed file systems and the various lock mechanisms deployed with network protocols. For example, column 38 lines 12-15 describes the use of opportunistic locks (Oplocks) that allow clients to cache the data file locally to increase performance while keeping the files synchronized and consistent. However, Miloushev is silent regarding ***storing the information*** [on an aggregate size change that occur on a database_data page] ***in the locks, discarding the locks upon a roll back of a transaction*** , and ***discarding the locks upon committing a transaction*** as applicants' claim.

In addition, applicants' representative respectfully submits that Miloushev is in a further disparate field of endeavor (distributed file systems), providing solutions to substantially different problems not reasonably pertinent to applicants' invention. Thus while concurrency and shared resources provide some common ground, the highly specified nature of database design and distributed file system design provide substantial differences such that Miloushev cannot properly provide a motivation to combine in an obviousness rejection of applicants' claimed invention. Examiner contends an individual ordinarily skilled in a generalized data processing art would seek to combine the cited references. Applicants' representative disagrees and respectfully submits that such a combination of skills in internet search and data collection (Julien), virtual

memory management design (Avner), and distributed file system design (Miloushev) to arrive at database page synchronization methods of applicants' suggests improper hindsight bias or an impermissible tendency to read into the prior art the teachings of applicants' invention.

For the foregoing reasons and the reason that claims 5-6 and 17-19 and depend directly or indirectly from independent claims 1 and 13, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP620US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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